



Date: November 3, 1980

Subject: Metal Purity - Applied Research Proposal

From/Location: T.F. Payne

To/Location: C.E. Fisher

Background

A weakening metal market could produce a change in the purity demand picture: high purity metal has historically had the highest demand in a weak market. To improve the overall purity at Columbia Falls, a plantwide purity improvement effort began in August, 1980. The number of pure metal pots has increased from 30 to 100 at present. However, there is some indication that the improvement may be levelling off; we may have reached a plateau.

There are several raw materials used with known high-impurity levels that have not been addressed. This proposal deals with a request to have those materials studied by an appropriate research facility to determine if there are feasible methods of removing the impurities. A preliminary discussion with Bill Davis of Anaconda's research facility in Tucson, Arizona seemed very promising.

Proposal

It is proposed that this project be submitted to Anaconda Aluminum's Technology group in Louisville. They can best determine the proper course of action on this project.

Discussion

The raw materials that are the subject of this proposal are as follows:

Basement Ore - This material is primarily alumina that is spilled into the basements during normal operations. During basement cleanup operations, the material is run through a $\frac{1}{2}$ " screen. The material that passes the screen is termed basement ore. The basement ore is taken to a separate silo and is used on the low purity pots. The contaminants are silicon from concrete and iron, both elemental and iron oxide.

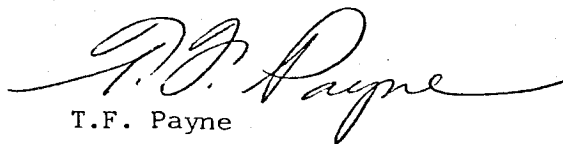
Basement Bath - The basement material that doesn't pass the screen, primarily bath, is taken to a temporary crushing site. It is loaded into a hopper and a belt conveyor takes it to a crusher. Personnel are required along the belt to hand-pick the concrete, flue insulation, briquets, and other debris from the bath materials. The bath is then crushed to minus $\frac{1}{4}$ " and used as makeup bath on all cells. Even with hand-picking the crushed bath contains substantial amounts of iron and silicon.

Scrubbed Ore - All alumina used at Columbia Falls passes through the dry scrubbers. Preliminary data from the Columbia Falls Laboratory indicates there may be appreciable amounts of iron that can be removed by high density magnetic separators after the ore leaves the dry scrubbers.

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The probable equipment involved in this project would be classification equipment for the silicon materials and low-and-high-density magnetic separation for iron. Applications could be reviewed for both the present situation and a long term capital project aimed at an improved basement materials handling system.

This project was first suggested by N.A. Bérubé (attachment). After a preliminary talk with Bill Davis of Anaconda, Tucson, it became apparent that they also had the ability to look at the iron in scrubbed ore. Preliminary samples have been sent to Tucson for their examination.


T.F. Payne

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